

**Testimony of  
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before the  
Subcommittee on Technology  
Committee on Science  
United States House of Representatives**

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Madame Chairman and Members of the Subcommittee:

I appreciate the opportunity to appear before you to discuss the Year 2000 effect on energy utilities. I want to commend you, Madame Chairman, and the Science Committee for holding a hearing on this critical issue. My name is Katie Hirning, and I am Chief Information Officer (CIO) for the Federal Energy Regulatory Commission (Commission or FERC). My responsibilities for information technology include operating and maintaining FERC's internal network and its automated systems, and developing infrastructure needed for electronic filing, workload processing, and information dissemination. I also represent the Commission on the President's Council on Year 2000 Conversion and as a member of the Small Agency Council.

The magnitude of the potential Year 2000 problem in the regulated energy industries is not yet known. However, FERC acknowledges the importance of the Year 2000 problem and recognizes that its involvement in solutions to it may be necessary. Because the energy sector is critical to the operations of all other sectors of the economy, I believe that it is essential for the federal government, along with industry, to promote awareness of this problem through cooperation and communication.

Today, I would like to: (1) describe the Year 2000 problem for energy businesses in general; (2) describe to our best knowledge what the industry is doing; and (3) inform you of what the Commission is doing, in coordination with the President's Council on Year 2000 Conversion, to encourage industry to take steps to ensure that our Nation's energy infrastructure continues to function at its full capacity on January 1, 2000 and beyond.

However, permit me first to lend a critical perspective to my testimony. The Commission regulates economic aspects of natural gas pipeline companies, electric utilities, and oil pipeline companies to ensure that their customers' rates and terms and conditions of interstate transmission service are just and reasonable. In addition, it licenses privately-owned and operated hydroelectric facilities on navigable waterways of the United States.

The Year 2000 issue presents an unusual problem for FERC because the Commission does not exercise direct authority over internal operations of the regulated companies' businesses as a general matter. The Commission would have regulatory authority over the ability of regulated utilities to recover, in their rates, the costs expended in correcting the Year 2000 problem, but not over the measures taken by the utilities to correct the problem. Furthermore, FERC's regulation does not encompass the entire energy sector or even all aspects of the natural gas, electric, or oil pipeline industries. Large portions of these industries are subject to the authority of other Federal agencies or state and local governments, or are self-regulated or unregulated.

### Year 2000 Compliance Within the Commission

The Commission is diligently addressing our own computer systems to make sure that they work on and after January 1, 2000. A Year 2000 task force was established in March 1997, to examine FERC's computer systems and identity systems and applications with the potential for non-compliance, and to suggest a strategy for formulating corrective action for each. Of the 12 automated systems that are considered to be mission-critical, one has already been made compliant, one will be upgraded, three have already been retired, four more will be retired, and three will be replaced. The agency has developed renovation codes as a contingency measure that will enable it to operate even if replacement systems are delayed in implementation. Automated equipment associated with the agency's physical plant, such as elevators and the security system, were also evaluated. All equipment is compliant except for the security system, which will be upgraded before March 1999.

### Year 2000 Problems for Energy Businesses

Some believe that correction of Year 2000 errors and testing of those corrections, if left incomplete, could have serious consequences. On the other hand, the consequences may be minor and quickly repaired or accommodated by contingency planning. The consequences of not fully understanding the seriousness of the problem in particular sectors *is the problem*. We believe that information and cooperation are the keys to addressing the Year 2000 conversion problem. Cooperative communication is necessary in order to quantify the nature of the problem, ascertain the completion of development and testing of solutions, and promote operational contingency plans in a timely manner to avoid any loss in power. There is a need to quantify what effect a

failed computer, computer software program, or embedded microprocessor would have on the production and delivery of electricity, gas, and oil. Thus far, available information is anecdotal, with very little empirical data on completion of conversion tasks and structured testing.

Conventional computer systems and embedded systems (a.k.a microprocessors, chips, and 'black boxes') are of major concern for the energy sector's Year 2000 readiness. The impact of conventional computer systems on the energy sector is not unlike its impact on other sectors.

Within the energy sector Year 2000 readiness includes conventional computer systems. Noncompliant software in a computer can affect a company's back office operations, such as financial control, human resources (payroll, benefits, etc.), purchasing, inventory, plant maintenance, and other administrative operations, and can impact direct operations and exchanges of information among energy companies. Energy companies use computers to connect plants, refineries, district offices, and major administrative and operational systems that interface with large data centers. Computers are also used to remotely control transmission system breakers, coordinate power generation schedules, compensate for large transmission line breaks, and provide protection against voltage, current, and frequency fluctuations.

Year 2000 readiness also includes the performance of thousands of embedded microprocessors. Embedded systems are present at plants, pipelines, control and dispatch centers, headquarters, and other energy facilities. Identifying Year 2000 errors in embedded systems generally requires significant manual effort. The process cannot be automated and is likely to

require physical inspection of hardware distributed widely throughout an organization. Inventory, assessment, and remediation of embedded systems are especially difficult and expensive.

### Reliability in the Electric Industry

In the electric industry are entities that generate, transport, or distribute power, or do all three. Also there are systems that transport fuel to power plants. Transmission and distribution systems move power from the power plants to consumers.

Security of supply is a major issue for the electric power business, especially during this period of transition to open and competitive markets. Although reliability is very important to natural gas and oil pipeline operations, the electric transmission systems are highly integrated machines that ties utilities and their customers together. The U.S. electric power system includes thousands of power generating plants and millions of consumers -- all tied together by the electric power grids. One electric power plant alone may have thousands of embedded systems. Without testing, the potential impact of Year 2000 errors could cause some embedded systems to malfunction, possibly resulting in a ripple effect across a portion of the grid. Because of the interconnected nature of the grid, it is important to test for malfunctions in interconnected systems as much as feasible.

Embedded systems are used to control and monitor power production and delivery equipment in electric utilities. Computer controlled equipment includes many date-sensitive

components, from very small programmable logic controllers to extensive network control systems. Many of the systems that have a date function may pass through the critical date without causing a fault. But they could later refuse to accept a modified instruction or even a new date entry. Other systems may have faults that could result in power outages.

Grid control is decentralized. Each utility or sometimes a small group of utilities controls its own grid. However, utilities are interconnected, and must coordinate their activities to maintain reliability. Rules for such coordination are set by ten regional reliability councils, which collectively form the North American Electric Reliability Council (NERC). At the May 4-5, 1998 meeting of the NERC Board of Trustees, the NERC decided -- at the request of the Department of Energy (DOE) -- to undertake a survey of its members to assess the likelihood of a Year 2000 problem, to determine the amount of testing that has been done by member utilities, and to report to DOE on its findings.

#### Reliability in the Oil and Gas Industries

There is a similar situation in the oil and gas industries, i.e., interdependencies between the production facilities and pipelines used for transporting and distributing oil and gas. The pipeline industry is made up of producer, transmission, and distributor sectors. Embedded systems occur in all sectors. Some oil and gas production facilities, such as offshore platforms may have ten thousand or more embedded chips. Many may be subsurface and physically difficult to access.

Both the gas and oil industries use Supervisory Control and Data Acquisition Systems

(SCADA) to acquire information from remote sections of pipeline, and to control the flow of fuel at remote locations by using computers linked to satellite and telephone communication systems. SCADA systems allow pipeline operators to obtain timely information, and allow producers to have access to information for purchasing distribution services based on the current volume of gas in a pipeline. Information provided by SCADA systems is accessed by users to purchase transportation service, check on billings, or arrange storage of gas that has been transported through a pipeline. Year 2000 compliance will be critical for SCADA systems.

Gas pipelines include compressor stations to move the gas through the lines, as well as gate stations where pressure is reduced, volumes of gas are measured, and regulators control the flow of gas into distribution lines. The gas industry is addressing the Year 2000 issues associated with interconnections among producing and distribution functions, i.e. "upstream and downstream" functions. Another Year 2000 focus is on newer equipment purchased to communicate station-to-station and to meter the flow of gas. As stations are generally 50 to 75 miles apart, if communications fail due to Year 2000 problems, alternative means must be used.

Many of the Year 2000 considerations for the gas industry are present in the oil industry, only in different form. For example, meters to measure oil use transducers to measure liquids. Oil SCADA systems require a shorter response time for an oil leak compared to gas leaks, which may be remediated by changing pressure. Unlike the electric industry, the oil and gas industries are fragmented, and do not have regional councils or control areas.

### The Industry Response

The extent of completed Year 2000 work within the energy industry is largely unknown. Compilation of this information has been inadequate. Larger utilities and some industry associations have promoted awareness of the Year 2000 issues and, in some cases, have begun to test and share potential solutions. The state of awareness and planning of smaller utilities and cooperatives is less certain. While a growing number of manufacturing companies are reporting the Year 2000 readiness status of their products on the Internet -- with varying degrees of specificity -- the number of product types is very large and the conditions for their use vary considerably. Because of the costs involved in developing and testing Year 2000 solutions, and certain legal considerations, some Year 2000 information is being made available to association members only.

One of the largest Year 2000 programs, offered for a fee by the Electric Power Research Institute (EPRI) to member companies of electric, oil, and gas associations, includes:

- an electronic system for real-time data and information collected from a number of industries, government agencies, vendors, and other service providers; and
- workshops for interactive discussion of methods and results among those involved in Year 2000 embedded systems efforts and the sharing of information among participants.

The Edison Electric Institute is working closely with the EPRI program, on behalf of investor-owned electric utilities. The National Association of Regulatory Utility Commissioners' educational program has a session scheduled in July to discuss Year 2000 issues. Year 2000



managers within the national oil, gas, and electric associations are in frequent contact, and are working together to address these issues. Several Year 2000 programs were initiated in the past year by industry associations. Some state commissions and local utilities are also working directly with national associations.

Last year the American Petroleum Institute (API) formed a Year 2000 taskforce of representatives from industry. They agreed to construct databases from various segments of the industry. API has scheduled a meeting in July to discuss Year 2000 compliance, information exchanges, and other concerns. API also sponsored and disseminated a Year 2000 awareness research paper. The Interstate Natural Gas Association of America has conducted a survey of their member companies Year 2000 compliance status, and the results are currently being analyzed. The Gas Research Institute is surveying their member companies to help formulate Year 2000 strategies.

#### The Federal Energy Regulatory Commission's Role

The Commission is, at the Chairman's direction, exploring how to mount an effective Year 2000 outreach program. It would be designed to encourage its regulated companies to take responsible action to ensure that their energy systems will continue to function on January 1, 2000 and beyond. Without cooperative communication between industry members and the federal government, understanding the potential magnitude and complete implications of the problem is difficult. We believe that information and cooperation are the keys to addressing the Year 2000 conversion problem. Cooperative communication is necessary in order to: (1) quantify the nature

of the problem; (2) ascertain the development and testing of timely solutions; and (3) promote operational contingency plans in case of potential loss of power.

#### Increasing Awareness of Year 2000 Problem

We are working cooperatively with other federal agencies as a member of the President's Council on Year 2000 Conversion. Through our participation in the Council's Energy Working Group, we are coordinating with other Federal agencies involved in the energy sector to develop effective programs for facilitating Year 2000 solutions throughout the energy industry. We are also developing an outreach program for the Commission's regulated entities and industry associations to promote awareness of the potential seriousness of the Year 2000 problem and the need to devote adequate resources to fix it.

At every opportunity, FERC's Chairman, Commissioners, and Office Directors are promoting awareness of the Year 2000 issue and encouraging the cooperation that already exists among energy organizations and their customers. Further, we hope to encourage companies to make more information available to the general public. The public needs specific information on how serious the problem is, what is being done to address it, and what they can expect come January 1, 2000. The Commission will also help make information available to our regulated companies and to the general public on Year 2000 through the FERC Web site regarding how serious the problem is, what is being done to address the problem, and information developed by others to solve technical issues.

Currently, we have begun to establish regular channels of communication with appropriate Year 2000 experts in industry and maintain an awareness of upcoming events and planned initiatives. We are taking steps to:

- promote awareness among companies under our jurisdiction;
- monitor progress within the industry;
- develop a link on the FERC web site to Year 2000 information;
- encourage the inclusion of Year 2000 subject matter in future industry seminars, trade events, television programs, and publications; and
- seek Year 2000 public speaking opportunities; and
- work with members of the Energy Working Group of the President's Year 2000 Conversion Council.

In the near future, the Chairman is considering taking the following steps:

- sponsoring a Year 2000 staff technical symposium for FERC's regulated companies and industry associations;
- offering to present Year 2000 information at industry workshops and seminars addressing the problem; and
- preparing Year 2000 promotional materials for dissemination at conferences and meetings.

If, over the next few months, we find that some segments of the industry appear to be unable to meet the requirements of Year 2000 deadline, we may have to take more direct measures to ensure an uninterrupted power supply. Those measures will vary by the amount of regulatory authority we have and the degree of cooperation we receive from industry.

## Conclusion

In the end, energy industry participants have the responsibility for addressing this problem. We believe the Commission has a central role nevertheless. The Chairman views it as the Commission's responsibility to the American public to help alleviate this potential threat to the reliability of our energy systems. We can promote the sharing of a Year 2000 information within the industry, its companies, suppliers, consultants, and state and local expertise. We can help disseminate what is known in other industries about similar products and problems, and we can maintain an awareness about factors external to the industry upon which energy depends.

We look forward to working with the Subcommittee on Technology in the months ahead and we welcome your questions.